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WEEKLY DAIRY OUTLOOK

April 4, 2022

This short weekly newsletter provides you with a summary of current dairy prices, translates product prices into component prices, and also summarizes major dairy related news.

Table 1. Spot dairy products prices on March 25th and April 1st, and their implied component prices.

	Mar 25, 2022	Apr 1, 2022	Change	Month to date
CME cheddar cheese				
- blocks ($/lb)	$ 2.2750	$ 2.2950	+ $ 0.0200	$ 2.2950
- barrels ($/lb)	$ 2.2500	$ 2.2525	+ $ 0.0025	$ 2.2525
CME butter ($/lb)	$ 2.7950	$ 2.7100	- $ 0.0850	$ 2.7100
CME Dry whey ($/lb)	$ 0.7200	$ 0.6100	- $ 0.1100	$ 0.6100
CME Nonfat dry milk ($/lb)	$ 1.8525	$ 1.8500	- $ 0.0025	$ 1.8500
-------	--------	Implied Prices	--------	-------
Butterfat ($/lb)	$ 3.177	$ 3.074	- $ 0.103	$ 3.074
Protein ($/lb)	$ 3.348	$ 3.492	+ $ 0.144	$ 2.492
Other solids ($/lb)	$ 0.537	$ 0.423	- $ 0.114	$ 0.423
Class III ($/cwt)	$ 24.19	$ 23.62	- $ 0.57	$ 23.62
Class IV ($/cwt)	$ 25.61	$ 25.22	- $ 0.39	$ 25.22

Comments

- The cash dairy markets were quite active this last week. Both cheddar block and barrel prices moved up some, while butter and powder prices went down. At closing time on Friday, cash butter price had fallen 8.5 ¢/lb from the prior Friday closing price; nonfat dry milk (**NDM**) price dropped slightly (0.25 ¢/lb), while whey price was markedly down by 11¢/lb. The perception of reduced world demand when China reported low whey import volumes for January and February, combined with increasing domestic whey stocks caused the drop in cash whey price. A 1¢/lb change in the price of dry whey translates into approximately 6¢/lb change in Class III price.

Table 2. Six-month strip of dairy futures at closing time last Friday, and changes in their 6-month averages from the prior Friday closings[1].

	Cheese ($/lb)	Butter ($/cwt)	Dry Whey ($/cwt)	NDM ($/cwt)	Class III ($/cwt)	Class IV ($/cwt)
April	2.233	273.000	72.500	182.500	23.84	25.10
May	2.356	270.000	65.550	184.500	24.46	25.10
June	2.399	267.250	62.775	186.300	24.22	25.15
July	2.347	265.000	62.125	187.500	24.20	25.12
August	2.329	264.000	60.975	187.500	23.94	24.95
September	2.320	263.050	60.000	186.000	23.67	24.86
Average	2.331	267.050	63.988	185.717	24.06	25.05
Weekly Change	-0.013	-5.220	-5.160	+0.310	-0.40	-0.19

[1] Futures prices on the Chicago Mercantile Exchange

Based on the next 6-month futures prices of dairy products, the implied 6-month prices of milk components used in Class III and nonfat solids used in Class IV pricings are reported in Table 3.

Table 3. Translation of futures dairy product prices into futures component prices.

	Butterfat ($/lb)	Protein ($/lb)	Other Solids ($/lb)	Nonfat Solids ($/lb)
April	3.098	3.287	0.542	1.641
May	3.062	3.772	0.470	1.660
June	3.029	3.896	0.442	1.678
July	3.001	3.757	0.435	1.690
August	2.989	3.711	0.423	1.690
September	2.978	3.695	0.413	1.675
Average	3.026	3.678	0.454	1.672
Weekly Change	-0.063	+0.025	-0.053	+0.003

- The USDA issued its *Dairy Product Report* for February last week. The agency reports production on a monthly basis, unadjusted for the number of days in a month. Obviously, there are more days in January than February, so that when comparing production in these two months it does make sense to compare production on a daily basis. This is why the numbers in Table 4 are all adjusted to a 30-d month basis. So, although the USDA reported a 5.3% reduction in total cheese production from January to February 2022, daily cheese production in February was in fact 4.8% above that of January. Butter production in February was down 1.4% compared to February '21, but showed a significant *4.8% increase compared to January '22*. This explains why butter prices dropped in both the cash and futures markets. The combined production of NDM (North-American markets) and skim milk powder (U.S. exports out of North America) was up 3.9% from January to February of this year. Likewise for dry whey production, which was up 3.3%.

Table 4. Dairy Products Report, February 2022 (30-d month basis).

	February 2022 (thousand lbs)	% Change from February 2021	% Change from January 2022
Cheese			
Total Cheese	1,188,745	+6.3	+4.8
American-style	476,089	+4.3	+4.3
Cheddar	334,601	+3.9	+4.0
Italian-style	503,420	+6.0	+3.3
Mozzarella	386,551	+4.4	+1.2
Butter	196,752	-1.4	+4.8
Dry Milk Product			
Nonfat Dry Milk	183,209	-6.9	+11.2
Skim Milk Powder	31,727	-6.4	-24.5
Combined	214,936	-6.8	+3.9
Whey Products			
Dry whey – total	80,355	-0.4	+3.3
Lactose – total	99,531	+17.4	+1.4
Whey Protein Concentrate	50,516	+25.7	+10.5

- Last Wednesday, the USDA released average national dairy product prices, component prices and minimum Class prices in effect in the Federal Milk Marketing Orders (**FMMO**s) for the month of **March**. All prices were up from both February 2022 and March 2021. Prices were as follows:

Table 5. Minimum Class and component prices in the Federal Milk Marketing Orders during the month of March 2022, and changes from February 2022 and March 2021.

	March 2022	February 2022	Change (Mar vs. Feb)	March 2021	Change (M '22 vs. M '21)
Cheese ($/lb)	2.0548	1.9068	+0.1480	1.5981	+0.4567
Blocks ($/lb)	2.0748	1.9091	+0.1657	1.6695	+0.4053
Barrels ($/lb)	2.0066	1.8746	+0.1320	1.5023	+0.5043
Butter ($/lb	2.7260	2.6668	+0.0592	1.5898	+1.1362
Nonfat Dry Milk ($/lb)	1.7954	1.7284	+0.0670	1.1169	+0.6785
Dry Whey ($/lb)	0.7943	0.7800	+0.0143	0.5537	+0.2406
Butterfat ($/lb)	**3.0935**	**3.0218**	**+0.0717**	**1.7176**	**+1.3759**
Protein ($/lb)	**2.7182**	**2.3168**	**+0.4014**	**2.6954**	**+0.0228**
Other Solids ($/lb)	**0.6131**	**0.5983**	**+0.0148**	**0.3652**	**+0.2479**
Class III ($/cwt)	**22.45**	**20.91**	**+1.54**	**16.15**	**+6.30**
Class IV ($/cwt)	**24.82**	**24.00**	**+0.82**	**14.18**	**+10.64**

- The substantial changes in milk component prices that we have experienced lately, combined with the dramatic changes in feed prices that have occurred since last year raise issues about the economics of feeding for milk components. I have previously described in a special issue of this newsletter (March 10, 2021) a method for assessing the economics of milk components production from a strategic standpoint. Here, I will update the picture for the strategic production of milk protein and will provide an insight on the current value of tactically feeding for protein production.

  Strategic nutrition targets the major nutrients. The 'strategic' diet does not contain 'exotic' components such as rumen-protected amino acids. It is just made of conventional ingredients to supply in a balanced fashion the nutrients known to be required by the cow. This approach is essentially 'requirements-based' and should be the first step in the long-term design of a feeding program.

  Strategic Nutrition for Milk Protein. I used prices of 26 feed ingredients traded in the Northeast in February to estimate the unit costs of the major nutrients (Net energy for lactation, metabolizable protein, effective NDF, and non-effective NDF) using the Sesame software. To provide a point of reference, corn was priced at $260/ton ($7.25/bu), 48% soybean meal at $525/ton, corn silage at $60/ton, and a 44% NDF alfalfa hay at $200/ton. Estimated nutrient costs were: NE_L, $0.10/Mcal; MP, $0.65/lb; eNDF, $0.10/lb; and neNDF, $0.01/lb. The nutrient cost to produce milk protein amounted to $1.23/lb of milk protein. Based on current futures markets, milk protein should be priced at an average of $3.64/lb from April to June (Table 3). Therefore, the strategic feeding for milk protein in the FMMOs over the next 3 months should return $2.41/lb of milk protein (i.e., $3.64 - $1.23). Clearly, feeding a diet balanced for the major required nutrients for protein production in the next 3 months should be highly profitable.

  Tactical Nutrition for Milk Protein. Here I will specifically examine the economics of feeding supplemental rumen protected methionine (**MET**) in an attempt to boost milk protein

production. Although MET is a *required* nutrient for protein production, it doesn't fit the classical definition of having a defined *requirement* because the marginal response to feeding metabolizable methionine (**Met-MET**) is generally quite low, typically in the 15 to 25% range. That is, only 15 to 25% of the supplemental Met-MET is recovered as MET in the additional milk protein produced. To make the matter worse, this 15-25% efficiency typically occurs only when the diet is already relatively rich in other essential amino acids.

Equation 6.6 on page 81 of the latest *Nutrient Requirements of Dairy Cattle, 8th Revised Edition* publishes by the National Academies of Science, Engineering and Medicine (**NASEM**) indicates a marginal response of 1.84 g of milk protein per additional g of Met-MET supply over all sorts of basal diets, many of which were not already 'well-balanced'. I will use a cost of $0.0275/g of Met-MET based on the published MET payload and current market price of a widely used protected MET supplement. Supplementing the diet with 10 g/cow per d of Met-MET would cost $0.275/cow per day. This would result in 18.4 g/cow per d of additional milk protein (i.e., 10 x 1.84), resulting in an additional gross income of $0.15/cow per d (i.e., 18.4 x $3.64 / 454). The resulting change in income-over-feed costs (**IOFC**) of -$0.13/cow per d would clearly not justify the use of a rumen protected source of MET in this instance. But what should we expect if we were working from a well-balanced diet?

With a diet already balanced for metabolizable protein providing near optimal essential amino acids such as histidine, isoleucine leucine and lysine, the marginal response to Met-MET is typically around 5.0 g of milk protein per additional g of Met-MET. Using once again a unit cost of $0.0275/g of Met-MET and a supplementation of 10 g/cow per d results in an additional feed cost of $0.275/cow per d. This supplementation results in 50 g/cow per d of additional protein yield (i.e., 10 x 5.0) with a value of $0.40/cow per d (i.e., 50 x $3.64 / 454). The net result is an increase in IOFC of $0.125/cow per d (i.e., $0.40 - $0.275). Because milk components in FMMOs are priced backward (e.g., component prices for March were determined in early April), one could argue that the Met-MET investment would have to be done for a month before the reward for the additional protein yield would be paid. That is, we would have a recurring monthly investment of $8.39/cow (i.e., $0.275 x 30.5) that would yield an additional gross income of $12.20/cow paid at the beginning of the following month (i.e., $0.40 x 30.5). The additional income occurs with a 30.5 day lag following the investment in Met-MET (it is actually closer to 20 days, but I used 1 month, or 30.5 days for simplicity). Therefore, the recurring monthly investment of $8.39 (paid for at the beginning of each of the following month) would generate a net *additional* flow of $3.81 over the following 11 months for a total *net return* of $45.72 per cow annually. Where I am from, this is an extraordinary annual return on investment. It's like you borrowed from me $8.39 at the beginning of this month. At the beginning of next month, you pay me back $12.20 and then you immediately borrow another $8.39 for which you will pay me back $12.20 at the beginning of the following month. And on, and on… As long as I am relatively confident that you will pay me back at least $8.39 at the beginning of each month then I should be quite willing to let you borrow the monthly $8.39. In the case of Met-MET supplementation, the current break-even for supplemental MET efficiency stands at 3.43 g of additional milk protein per g of supplemental Met-MET (or a 10.3% MET transfer efficiency from absorbed MET to milk MET). The break-even for milk protein price is currently $2.50/lb.

I generally advise to use the projected average milk protein price for the next 3 months to make a tactical decision. This is because across all the Met-MET research that I conducted while at Ohio State, it took between 6 to 8 weeks for the full expression of milk protein yields from Met-MET supplementation.